Browning®

OtN Series 3000
Gearmotors and Reducers

Emerson Industrial Automation
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Application Engineering: 800 626 2093
www.PowerTransmissionSolutions.com

FORM
9020E
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⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Avoid contact with energized circuits or rotating parts.
- Be sure shaft key is fully captive before unit is energized.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

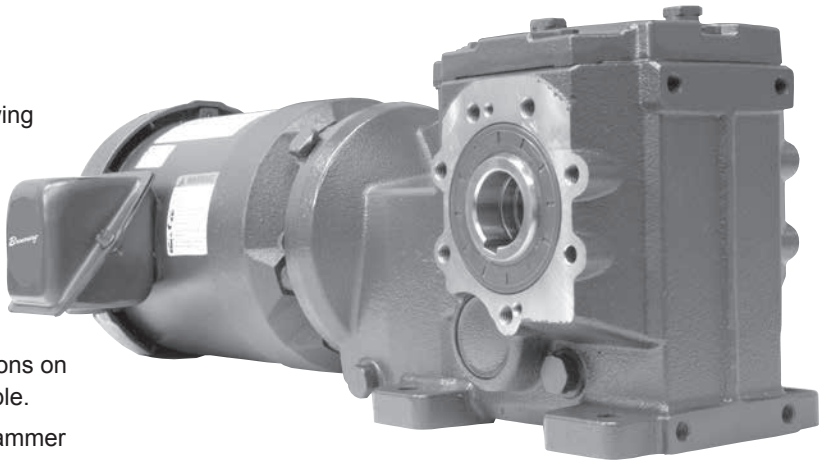
⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.
- All electrical work should be performed by qualified personnel and compliant with local and national electrical codes.

Thank you for choosing an OtN Series 3000 gearmotor or reducer.

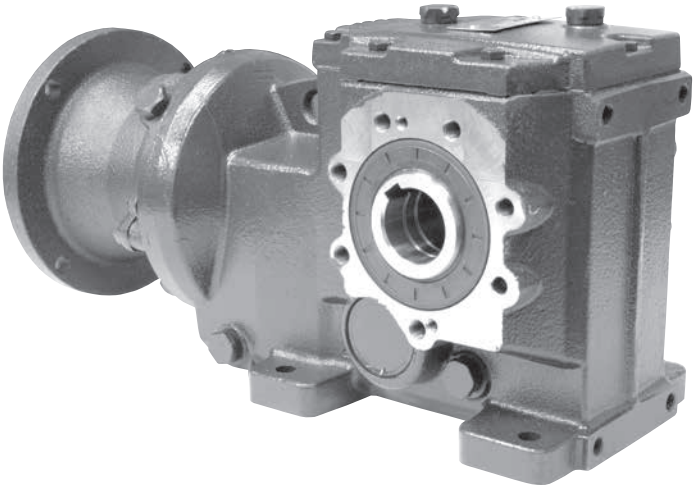
Installation Instructions

Start-Up



- Before operating the reducer or gearmotor, the following must be done:
- If foot or flange mount, install the drive on a rigid and vibration-free surface. If shaft mounted, install the drive onto a rigidly supported drive shaft.
- Remove the protective coating on the shaft and flange. Use solvent if necessary.
- Carefully install coupling, sheaves, sprockets, or pinions on shaft. Mount as close to the shaft shoulder as possible.
- It is preferable to use heat instead of force. Do not hammer on shaft!
- Check shaft alignment when using direct coupling.
- Check shaft parallelism when using belt or chain drive.

  CAUTION : Refer to belt manufacturer's recommendation for belt tension. (Tension should not be applied on chain drives.)
- Check oil level in oil lubricated reducer.
- Install breather plug in the plug hole per recommendations shown on page (5).



Maintenance

To provide safe operation and to avoid problems, it is recommended the reducer or gearmotor be inspected every 50 hours of operating time.

- Check mounting bolts and belt tension (if applicable).

The preventative maintenance list below should be performed every 5000 hours of operating time:

- Check oil level and add oil if necessary.
- Make sure the vent hole in the breather is clean

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Lubricants

Series 3000 OtN gearing is shipped with one of the following synthetic lubricants per the table below and fitted with a magnetic drain. Each reducer is filled according to the mounting position specified when ordered. Refer to unit nameplate and the chart and table on page 4 and 5 for mounting position arrangement for your unit.

In the case of synthetic oil, the lubricant does not require changing but it is recommended that proper oil level be checked periodically.

Standard Synthetic Gear Oil (Non - Food Grade)

No Backstop

Manufacturer	-25° F to 125° F (-30° C to 50° C)
Fuchs*	Sintogear* 125
Mobil*	Mobilgear* SHC 150
Shell*	Omala* S4 GX 150

With Backstop (1)

Manufacturer	-25° F to 125° F (-30° C to 50° C)
Shell	Morlina S4 B 700
Mobil	SHC 629

Standard Synthetic Gear Oil (Food Grade)

No Backstop

Manufacturer	22° F to 125° F (-20° C to 50° C)
Mobil	SHC Cibus 150

CAUTION: Never mix synthetic oil and mineral oil.

(1) Never use extreme pressure (EP) oil in a reducer with a backstop.

Acceptable Mineral Oil Lubricants

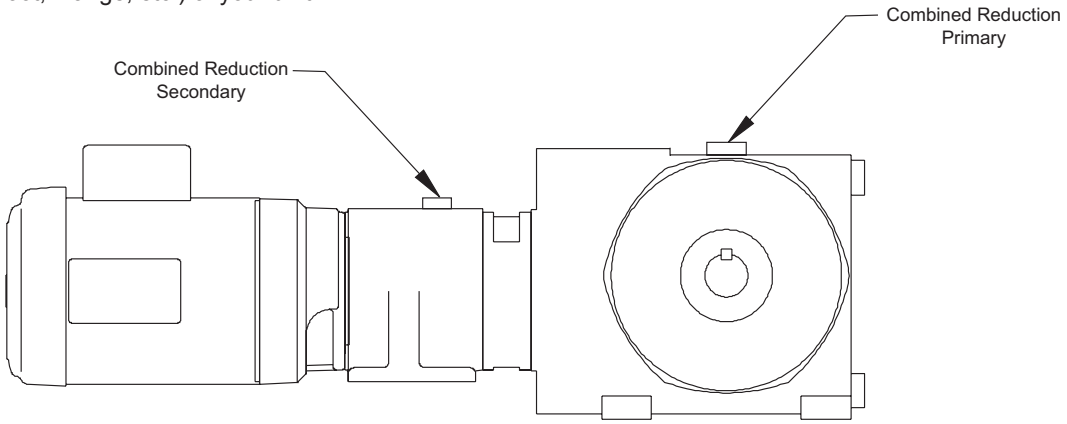
Ambient Range of Installation					
-4°F to 14°F (-20°C to 10°C)	14°F to 122°F (-10°C to 50°C)				122°F and Above (50°C +)
	No Backstop			With Backstop (1)	
ISO VG 68	ISO VG 100	ISO VG 150	ISO VG 220	ISO VG 150	ISO VG 320

Combined OtN 3000 Gearing

Consists of an OtN primary gear housing and a CbN secondary gear housing. The table below provides the CbN oil volumes in quarts.

OtN Frame Size	Sec. Gear Size	Mounting Position											
		B		P		H		T		V		W	
		Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.
3245	CbN 30	**	0.64	**	0.64	**	0.64	**	0.64	**	0.64	**	0.64
3365	CbN 31	**	0.63	**	1.16	**	0.90	**	1.00	**	1.22	**	1.48
3475/3476	CbN 31	**	0.63	**	1.16	**	0.90	**	1.00/1.30	**	1.22	**	1.48
3585/3586	CbN 31	**	0.63	**	1.16	**	0.90	**	1.00/1.30	**	1.22	**	1.48
3695/3696	CbN 32	**	1.00	**	2.38	**	1.64	**	1.85/2.43	**	2.38	**	2.85
3705/3706	CbN 32	**	1.00	**	2.38	**	1.64	**	1.85/2.43	**	2.38	**	2.85
3825/3826	CbN 32	**	1.00	**	2.38	**	1.64	**	1.85/2.43	**	2.38	**	2.85

** Refer to table on page 5 for the OtN oil volume based on frame size, Mounting Configuration, Mounting Position and Type of Mounting (i.e. Foot, Flange, etc.) of your unit.



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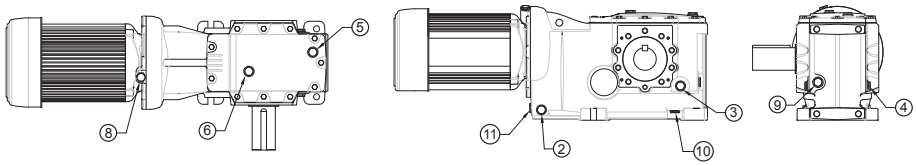
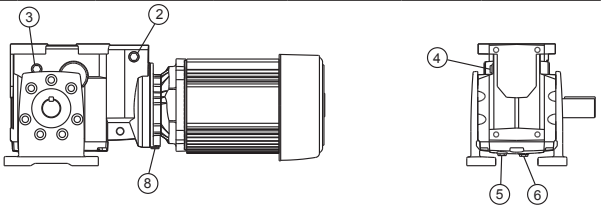
Plug Location and Oil Volume

S2 Configuration - All mounting styles
S1 Configuration - All mounting styles (except foot mounted 33, 34, and 35 – see below)



Design	Gear Frame Size	Plug Type	Mounting Position											
			B		P		H		T		V		W	
			Plug #	Oil Volume Quarts+	Plug #	Oil Volume Quarts+	Plug #	Oil Volume Quarts+	Plug #	Oil Volume Quarts+	Plug #	Oil Volume Quarts+	Plug #	Oil Volume Quarts*
Double Reduction	31	Level	12	0.95	12	1.06	6	0.95	6	0.8	2	1.64	6	1.11
		Drain	2		6		2		12		5		2	
		Breather	6		2		8*D		8*G		8		5	
		Fill	5		2		12		2		12		5	
	32	Level	4	1.96	4	2.06	6	1.74	6	2.06	2	3.12	6	2.48
		Drain	2		6		2		4		4		2	
		Breather	6		2		4		2		8		5	
		Fill	5		2		4		2		2		5	
Triple Reduction	32	Level	4	0.55	4	1.82	5	1.5	6	1.5	2	2	6	1.4
		Drain	2		5		2		8		5		8	
		Breather	6		3		4		3		8		5	
		Fill	5		3		4		2		8		4	
	33 (A)	Level	3	1.16	3	3.7	5	3.49	6	2.96	2	3.96	6	2.75
		Drain	2		5		2		4		5		8	
		Breather	6		4		4		3		4		5	
		Fill	5		2		4		2		2		4	
	34	Level	3	1.37	3	6.45	5	5.39	6	4.65	2	6.76	6	3.91
		Drain	2		5		2		4 or 8		5		8	
		Breather	6		3		4		3		8		5	
		Fill	5		2		4		2		8		5	
	35	Level	3	2.85	3	8.88	6	5.39	6	7.72	2	11.42	6	6.61
		Drain	2		5		2		8		5		8	
		Breather	6		3		5		3		8		5	
		Fill	5		2		5		2		8		5	
	36	Level	5**	6.08	10**	19.24	4**	14.28	3**	12.9	11**	23.36	9**	13.95
		Drain	2		5		3		4		5		2	
		Breather	5		10		4		3		11		9	
		Fill	5		10		4		3		11		9	
	37	Level	5**	10.58	10**	25	4**	20.3	3**	17.97	11***	35.94	9**	25.05
		Drain	2		5		3		4		5		2	
		Breather	5		10		4		3		11		9	
		Fill	5		2		4		3		11		9	
	38	Level	5**	10.57	10**	34.87	4**	29.06	3**	22.19	11**	43.32	9**	25.36
		Drain	11		5		3		4		5		2	
		Breather	5		10		4		3		11		9	
		Fill	5’		11		4		3		11		9	



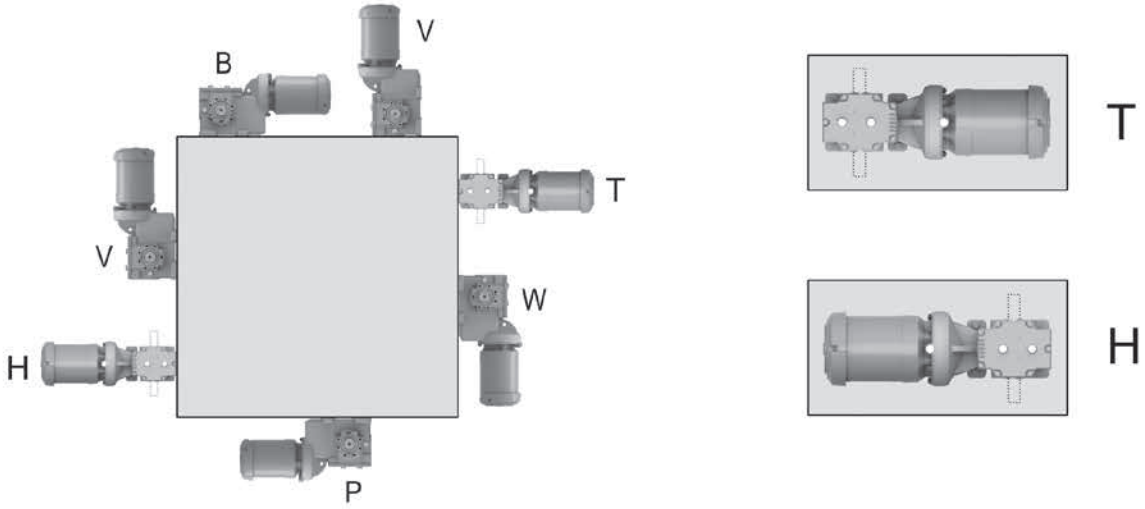
S1 Configurations 33D,33G,33X for Frames 33,34 and 35.
See above for all other mounting.

Gear Frame Size	Plug Type	Mounting Position											
		B		P		H		T		V		W	
		Plug #	Oil Volume Quarts+	Plug #	Oil Volume Quarts+	Plug #	Oil Volume Quarts+	Plug #	Oil Volume Quarts+	Plug #	Oil Volume Quarts+	Plug #	Oil Volume Quarts+
33	Level	3	3.7	3	1.16	6	2.96	5	3.49	2	3.96	6	2.75
	Draining	6		2		4		2		5		8	
	Breather	2		6		3		4		4		5	
	Filling	2		5		2		4		2		4	
34	Level	3	6.45	3	1.37	6	4.65	6	5.39	2	6.76	6	3.91
	Draining	6		2		4 or 8		2		5		8	
	Breather	2		6		3		5		8		5	
	Filling	2		5		2		5		8		5	
35	Level	3	8.88	3	2.65	6	7.72	6	5.39	2	11.42	6	6.61
	Draining	6		2		8		2		5		8	
	Breather	2		6		3		5		8		5	
	Filling	2		5		2		5		8		5	

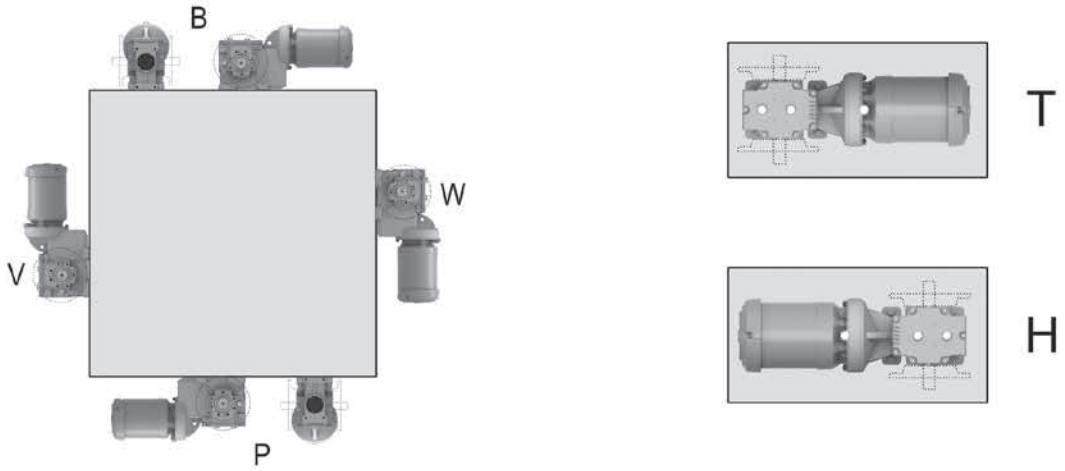
+ Adaptor is assembled to position breather location on top when mounted in this position
** This is location for dipstick to check oil level
*** This location for dipstick with extension added to check oil level

Gearbox Mounting Positions

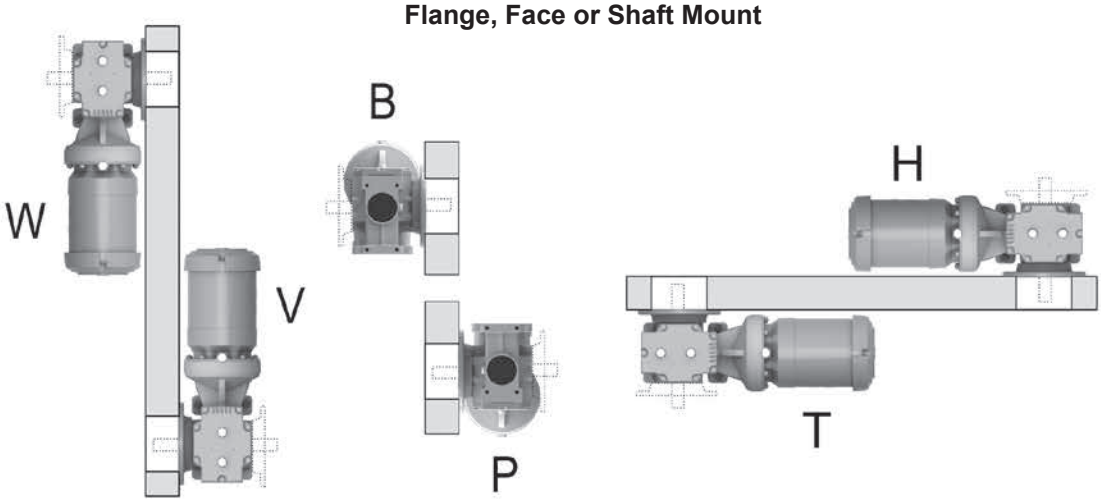
Foot Mount



Foot Mount with Face or Flange



Flange, Face or Shaft Mount



1. OtN Shaft Mount Reducer Installation

For long service and dependable performance, an OtN shaft mounted gear unit must be properly supported and accurately aligned. The following instructions are a step-by-step guide to meeting these requirements for an OtN 3000 design shaft mounted product. If there is a need to vary or deviate from any of these installation instructions, contact Application Engineering Department at 1-800-626-2093 before completing the installation.

CAUTION: When the driven shaft is smaller than the maximum bushing size for a gear frame, check the driven shaft and key stress per ANSI/AGMA Std. 6001-D97 for the application.

1.1 Reducer and Driven Shaft Preparation

1.1.1 The driven shaft diameter is to be within the commercial tolerances for turned, ground and polished bars. The key and keyseat in the driven shaft are to be in accordance with commercial standards for the size, depth, offset, and parallelism.

1.1.2 The driven shaft on which the gear unit is to be mounted must be straight, clean, and free of burrs.

1.1.3 Rotate the driven shaft on which the gear unit is to be mounted so that the shaft keyseat is in the upward position.

1.1.4 A lifting lug is provided to lift the gear reducer or gearmotor into position.

WARNING! Never lift the gear unit by the input or output shaft. The lifting lug is designed for lifting only the gear reducer or gearmotor. Do not use the lifting lug to lift attached assemblies.

Do not apply grease, oil, or any anti-seize compounds to the taper bore of the reducer, barrel of the bushing, driven shaft or the bushing bore. If any of these substances are applied, equipment failure and personal injury may result.

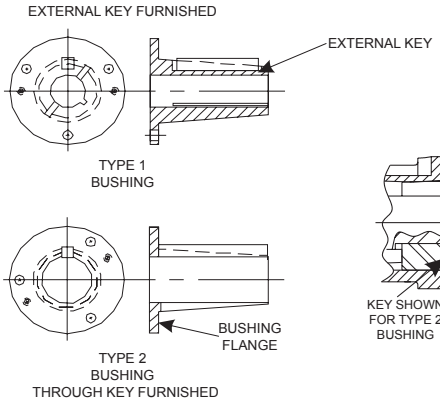


Figure 1-1

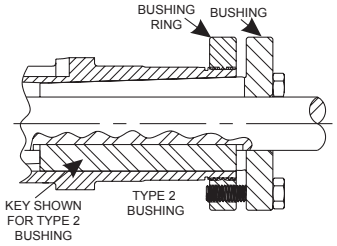


Figure 1-2

1.2 Determine Mounting Configuration – Bushed Bore Models

Due to the unique design of OtN bushed shaft mounted product, the reducer may be mounted to the driven shaft in a variety of configurations. The following instructions will help to determine the correct mounting configuration based on the available shaft and key length

1.2.1 Measure the available driven shaft length “H” (in inches) starting with the end of the driven shaft to the first obstruction or point of interference.

1.2.2 Measure the length of available keyseat “K” in the driven shaft (in inches) starting from the end of the shaft to the end of the useable keyseat.

1.2.3 The following sections 1.3, 1.4, 1.5 show the three standard mounting configurations for the Browning® OtN tapered bushed “33B” gearing. Refer to the following sections **in sequence** to determine the optimum mounting configuration for your application.

1.2.4 Compare the measured values of H and K of the driven shaft to the tabulated values of H and K. If the measured values for H and K are **greater than** the tabulated values, the mounting configuration shown in the figure may be used. If the measured values for H and K are **less than** the tabulated values, proceed to the next figure and repeat this step.

Note: If the measured values for H and K are less than the tabulated values shown in 1-5, contact the Application Engineering Department at 1-800-626-2093.

1.2.5 Tightening torque for bushing components.

Table 1.2.5

Gear Frame	33B Taper Bushed				Screw Conveyor	
	Tapered Bushing Cap screws		End Cap Setscrews (nylon tipped)		Keeper Bolts	
	Size	Ft.-Lbs	Size	In-Lbs	Size	Ft.-Lbs
31	5/16-18	16	1/4-20	60	-	-
32	5/16-18	16	1/4-20	60	1/2-13	99
33[1]	5/16-18	16	1/4-20	60	1/2-13	99
33A	3/8-16	29	1/4-20	60	-	-
34	3/8-16	29	1/4-20	60	5/8-11	200
35	3/8-16	29	1/4-20	60	3/4-10	350
36	3/8-16	29	1/4-20	60	3/4-10	350
37	1/2-13	70	1/4-20	60	1-8	600
38	1/2-13	70	1/4-20	60	1-8	600

[1] This design is replaced by 33A design effective Jan. 2010 for 33B output

1.3 Mounting Configuration with Bushing Outboard of Load

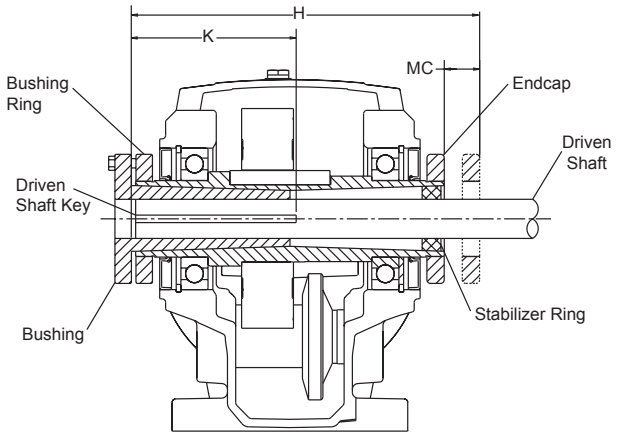


Figure 1-3

Table 1-3 Dimensions for Mounting Configuration with Bushing Outboard of Load

Gear Frame	End cap Clearance	Minimum Shaft Mounting Length	Minimum Key Connection Length
	MC	H	K
31	0.85	8.23	2.88
32	0.97	9.28	4.38
33 [1]	0.97	9.21	4.38
33A	1.03	11.16	4.63
34	1.03	11.34	4.63
35	1.21	12.23	5.63
36	1.31	16.75	6.13
37	1.44	18.08	7.38
38	1.69	18.43	7.38

[1] This design is replaced by 33A design effective Jan. 2010

1.3.1 On the input shaft side, thread the bushing ring onto the hollow reducer quill until the bushing ring is flush with the end of the reducer quill shaft.

1.3.2 Place the end cap on the driven shaft with the threaded bore facing the end of the shaft. Slide the stabilizer ring on the driven shaft with the small end of the taper toward the end of the shaft.

1.3.3 Install Key(s)

Type 1 Bushing (2 keys):

- Install the external bushing key into the bushing as shown in Figure 1-1 (external bushing key is supplied with the bushing kit)
- Install the driven shaft key (customer supplied) into the driven shaft keyseat. Position the end of the driven shaft key even with the end of the driven shaft. Retain this key to prevent movement.

1.3.4 Install Reducer

Type 1 Bushing

- Mount the reducer on the driven shaft with the bushing ring facing outward toward the end of the driven shaft
- Locate the reducer on the driven shaft such that approximately .50 inch of the driven shaft extends out beyond the end of the reducer quill.
- Start the bushing (small end first) by aligning the keyway in the bushing with the key previously installed in the driven shaft.
- Continue moving the bushing into position and rotate the input of the reducer as required to align the external bushing key with the keyway in the reducer quill.
- Rotate the bushing ring clockwise to align the clearance holes in the bushing with the threaded holes in the bushing ring. (This will require less than 1/2 turn of the bushing ring).
- Install the bushing cap screws and hand tighten. Reposition the reducer until the end of the driven shaft is even with the end of the bushing ring.
- Slide the stabilizer ring into the reducer quill and thread the end cap on hand tight.
- Tighten the bushing cap screws evenly around the bushing flange to the recommended torque as shown Table 1.2.5. See bolt torque specifications section.
- Tighten the end cap again until hand tight. Tighten the setscrew in the end cap to the recommended torque from Table 1.2.5.

Type 2 Bushing

- Mount the reducer on the driven shaft with the bushing ring facing outward toward the end of the driven shaft.
- Rotate the input of the reducer as required to align the external bushing key with the keyway in the reducer quill.
- Locate the reducer on the driven shaft such that approximately .50 inch of the driven shaft extends out beyond the end of the reducer quill.
- Start the bushing (small end first) by aligning the keyway in the bushing with the key previously installed in the driven shaft.
- Rotate the bushing ring clockwise to align the clearance holes in the bushing with the threaded holes in the bushing ring. (This will require less than 1/2 turn of the bushing ring).
- Install the bushing cap screws and hand tighten. Reposition the reducer until the end of the driven shaft is even with the end of the quill.
- Slide the stabilizer ring into the reducer quill and thread the end cap on hand tight.
- Tighten the bushing cap screws evenly around the bushing flange to the recommended torque as shown in Table 1.2.5.
- Tighten the end cap again until hand tight. Tighten the setscrew in the end cap to the recommended torque from Table 1.2.5.

Note: The key length must be sufficient to engage the full length of the bushing. The shaft must engage the full length of the reducer shaft (Refer to “H” in Figure 1-3).

Note: There are three (3) series of bushing keys used in the Type 2 bushing system: rectangular, square and offset. In most cases, the key supplied will be rectangular or offset. Use caution when installing rectangular keys as some may visually appear square. The key should install in the bushing keyway with a sliding type fit. The key in the driven shaft keyseat should be retained to prevent movement.

WARNING! The cap screws must thread into the bushing ring and not the bushing. Threaded holes in the bushing are for removal only. If assembled incorrectly, equipment failure and personal injury may result.

1.4 Mounting Configuration with Bushing on Load Side of Reducer and Using Stabilizer Ring

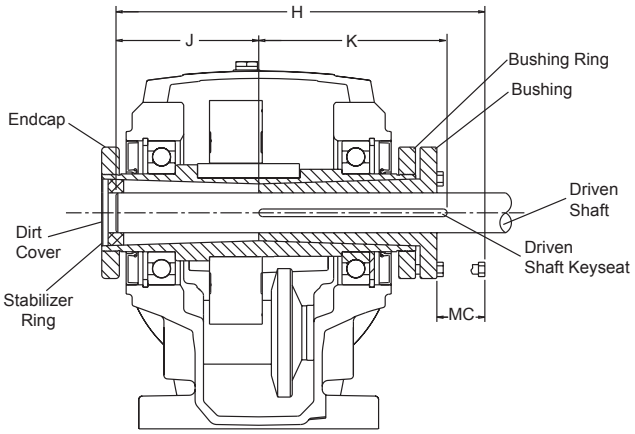


Figure 1-4

Table 1-4 Dimensions for Mounting Configuration with Bushing on Load Side of Reducer and Using Stabilizer Ring

Gear Frame	Bolt Clearance	Minimum Shaft Mounting Length	Minimum Key Connection Length	Max.
	MC	H	K	J
31	1.50	9.11	2.88	4.73
32	1.75	10.54	4.38	4.28
33[1]	1.75	10.47	4.38	4.21
33A	1.88	12.23	4.63	5.83
34	1.88	12.51	4.63	6.01
35	1.88	13.13	5.63	5.62
36	1.88	17.50	6.13	9.49
37	2.25	19.76	7.38	10.13
38	2.75	19.05	7.38	7.74

[1] This design is replaced by 33A design effective Jan. 2010

1.4.1 **For Type 1 bushings which require an external key and a shaft key**: Install the key (supplied with the bushing) in the external keyseat of the bushing as shown in Figure 1-1. Install the shaft key (not supplied) in the shaft keyseat and retain to prevent movement. Install the bushing onto the shaft, flanged end first, align the bushing keyway with the shaft key and position the bushing over the key.

Note: Key length must be sufficient to engage the full length of the bushing. The shaft must engage the full length of the bushing.

1.4.2 **For Type 2 bushings which require one through key**: Install the bushing on the shaft, flanged end first. Align the keyway in the bushing with the keyseat in the shaft and install the shaft key. Position the shaft key flush against the inside flange surface of the bushing. See Figure 1-2 Shaft Key and Bushing Location.

Note: There are three (3) series of bushing keys used in the Type 2 bushing system: rectangular, square and offset. In most cases, the key supplied will be rectangular or offset. Use caution when installing rectangular keys as some may visually appear square. The key should install in the bushing keyway with a sliding type fit. The key in the driven shaft keyseat should be retained to prevent movement.

Note: The shaft must be engaged the full length of the bushing.

1.4.3 On the side where the driven shaft enters, thread the bushing ring onto the hollow quill until the bushing ring is flush with the end of the hollow shaft. Rotate the gear unit input to align the keyway in the hollow quill with the bushing/shaft key. Position the reducer on the shaft with the bushing ring toward the bushing.

1.4.4 Slide the stabilizer ring onto the driven shaft with the small end of the taper toward the reducer. Insert the stabilizer ring into the quill.

1.4.5 Thread the end cap and the dirt cover (not used if driven shaft extends beyond the end of the hollow quill) onto the hollow quill until hand tight. Do not tighten the end cap.

1.4.6 Rotate the bushing ring clockwise until the tapped holes align with the drilled holes in the bushing flange. Prior to tightening the cap screws, make sure the bushing key is as close as possible to the inside flange of the bushing as shown in Figure 1-2 and the bushing is positioned on the shaft as required in Figure 1-4. Dimensions for rear mounting configuration with the stabilizer ring.

1.4.7 Install the bushing cap screws and tighten all the cap screws evenly around the bushing flange to the required torque. See bolt torque specifications Table 1.2.5.

1.4.8 Tighten the end cap again until hand tight. Tighten the setscrews to the recommended torque. See bolt torque specifications Table 1.2.5.

WARNING! The cap screws must thread into the bushing ring and not the bushing. Threaded holes in the bushing are for removal only. If assembled incorrectly, equipment failure and personal injury may result.

1.5 Mounting Configuration with Bushing on Load Side of Reducer and without Stabilizer Ring

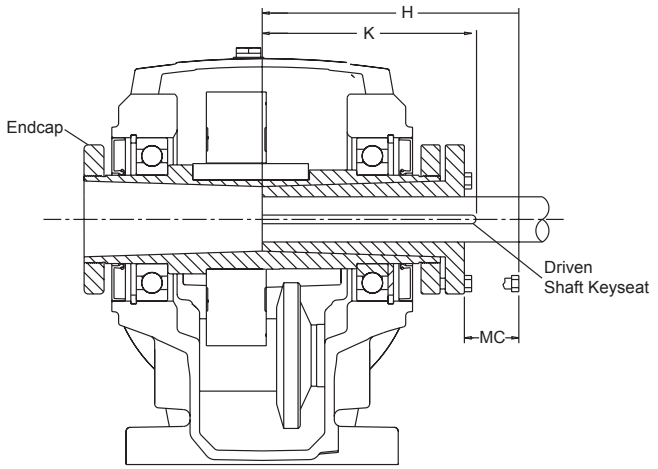


Figure 1-5

Table 1-5 Dimensions for Configuration with bushing on Load Side and no Stabilizer Ring

Gear Frame	Bolt Clearance	Minimum Shaft Mounting Length	Minimum Key Connection Length
	MC	H	K
31	1.50	4.38	2.88
32	1.88	6.25	4.38
33	1.88	6.25	4.38
33A	1.88	6.50	4.63
34	1.88	6.5	4.63
35	1.88	7.5	5.63
36	1.88	8	6.13
37	2.25	9.75	7.38
38	2.75	11.31	7.38

1.5.1 **For Type 1 bushings which require an external key and a shaft key**: Install the key (supplied with the bushing) in the external keyseat of the bushing as shown in Figure 1-1. Install the shaft key (not supplied) in the shaft keyseat and retain to prevent movement. Install the bushing onto the shaft, flanged end first, align the bushing keyway with the shaft key and position the bushing over the key.

Note: Key length must be sufficient to engage the full length of the bushing. The shaft must engage the full length of the bushing.

1.5.2 **For Type 2 bushings which require one through key**: Install the bushing on the shaft, flanged end first. Align the keyway in the bushing with the keyseat in the shaft and install the shaft key. Position the shaft key flush against the inside flange surface of the bushing. See Figure 1-2 Shaft Key and Bushing Location.

Note: There are three (3) series of bushing keys used in the Type 2 bushing system: rectangular, square and offset. In most cases, the key supplied will be rectangular or offset. Use caution when installing rectangular keys as some may visually appear square. The key should install in the bushing keyway with a sliding type fit. The key in the driven shaft keyseat should be retained to prevent movement.

Note: The shaft must be engaged the full length of the bushing.

1.5.3 On the side opposite the driven shaft entry, thread the bushing ring onto the hollow quill until the bushing ring is flush with the end of the hollow shaft. Rotate the gear unit input to align the keyway in the hollow quill with the bushing/shaft key. Position the reducer on the shaft with the bushing ring toward the bushing.

1.5.4 Thread the end cap and the dirt cover (not used if driven shaft extends beyond the end of the hollow quill) onto the hollow quill until it bottoms out. Tighten the setscrew to the recommended torque. See bolt torque specifications Table 1.2.5.

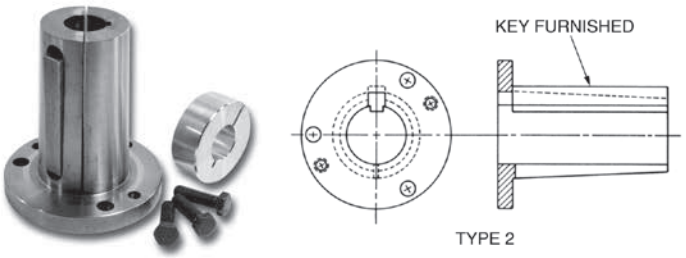
1.5.5 Rotate the bushing ring clockwise until the tapped holes align with the drilled holes in the bushing flange. Prior to tightening the cap screws, make sure the bushing key is as close as possible to the inside flange of the bushing as shown in Figure 1-2 and the bushing is positioned on the shaft as required in Table 1-5. Dimensions for rear mounting configuration with the stabilizer ring.

1.5.6 Install the bushing cap screws and tighten all the cap screws evenly around the bushing flange to the required torque. See bolt torque specifications Table 1.2.5.

WARNING! The cap screws must thread into the bushing ring and not the bushing. Threaded holes in the bushing are for removal only. If assembled incorrectly, equipment failure and personal injury may result.

Taper Bushing Selection

Each Series 3000 OtN can be ordered with an inch or metric Tapered Bushed Output. This “33B” mounting configuration will include the appropriate bushing kit when a bore is defined at order entry. The table below shows the various stocked bushing bores for each OtN frame that can be specified. Each bushing kit is supplied with bushing, hardware for mounting and a stabilizer ring unassembled. If bushings are required as a spare or bore changed in the field, refer to the OtN 3000 frame and bore to select the required kit below.



OtN Frame	Meas. Unit	Bushing Number	Bore[1]	Shaft Keyseat Required	Type
31	Inch	105TBP100	1”	1/4 x 1/8 x 2 1/2	2
		105TBP103	1 3/16”	1/4 x 1/8 x 2 1/2	2
		105TBP104	1 1/4”	1/4 x 1/8 x 2 1/2	2
		105TBP105	1 5/16”	5/16 x 5/32 x 2 1/2	2
	Metric *	105TBP30MM	30 mm	8 x 3.5 x 65 (mm)	2
32 & 33	Inch	107TBP105	1 5/16”	5/16 x 5/32 x 3 7/8	2
		107TBP106	1 3/8”	5/16 x 5/32 x 3 7/8	2
		107TBP107	1 7/16”	3/8 x 3/16 x 3 7/8	2
	Metric *	107TBP30MM	30 mm	8 x 3.5 x 100 (mm)	2
		107TBP35MM	35 mm	10 x 4 x 100 (mm)	2
33A	Inch	115TBP107	1 7/16	3/8 x 3/16 x 4 1/8	2
		115TBP108	1 1/2	3/8 x 3/16 x 4 1/8	2
		115TBP110	1 5/8	3/8 x 3/16 x 4 1/8	2
		115TBP111	1 11/16	3/8 x 3/16 x 4 1/8	2
		115TBP112	1 3/4	3/8 x 3/16 x 4 1/8	2
		115TBP114	1 7/8	1/2 x 1/4 x 4 1/8	2
		115TBP115	1 15/16	1/2 x 1/4 x 4 1/8	2
	Metric *	115TBP40MM	40 mm	12 x 4 x 105 (mm)	2
		115TBP45MM	45 mm	14 x 4.5 x 105 (mm)	2
34	Inch	115TBP111	1 11/16	3/8 x 3/16 x 4 1/8	2
		115TBP112	1 3/4	3/8 x 3/16 x 4 1/8	2
		115TBP114	1 7/8	1/2 x 1/4 x 4 1/8	2
		115TBP115	1 15/16	1/2 x 1/4 x 4 1/8	2
	Metric *	115TBP45MM	45 mm	14 x 4.5 x 105 (mm)	2

[1] Bushing bore shown must be selected by customer based on complete application details

* Metric bushings have metric bores and require metric keyseats as shown in mm.

OtN Frame	Meas. Unit	Bushing Number	Bore[1]	Shaft Keyseat Required	Type
35	Inch	207TBP200	2	1/2 x 1/4 x 5 1/8	2
		207TBP202	2 1/8	1/2 x 1/4 x 5 1/8	2
		207TBP203	2 3/16	1/2 x 1/4 x 5 1/8	2
		207TBP204	2 1/4	1/2 x 1/4 x 5 1/8	2
		207TBP207	2 7/16	5/8 x 5/16 x 5 1/8	2
	Metric *	207TBP50MM	50 mm	14 x 4.5 x 130 (mm)	2
		207TBP60MM	60 mm	18 x 5.5 x 130 (mm)	2
36	Inch	215TBP207	2 7/16	5/8 X 5/16 X 5 5/8	2
		215TBP208	2 1/2	5/8 X 5/16 X 5 5/8	2
		215TBP211	2 11/16	5/8 X 5/16 X 5 5/8	2
		215TBP215	2 15/16	3/4 X 3/8 X 5 5/8	2
	Metric *	215TBP60MM	60 mm	18 x 5.5 x 140 (mm)	2
		215TBP70MM	70 mm	20 x 6 x 140 (mm)	2
37	Inch	307TBP214	2 7/8	3/4 x 3/8 x 6 3/4	2
		307TBP215	2 15/16	3/4 x 3/8 x 6 3/4	2
		307TBP300	3	3/4 x 3/8 x 6 3/4	2
		307TBP306	3 3/8	7/8 x 7/16 x 6 3/4	2
		307TBP307	3 7/16	7/8 x 7/16 x 6 3/4	2
	Metric *	307TBP75MM	75 mm	20 x 6 x 170 (mm)	2
		307TPB80MM	80 mm	22 x 7 x 170 (mm)	2
		307TBP85MM	85 mm	22 x 7 x 170 (mm)	2
38	Inch	315TBP215	2 15/16	3/4 x 3/8 x 7 15/16	2
		315TBP300	3	3/4 x 3/8 x 7 15/16	2
		315TBP303	3 3/16	3/4 x 3/8 x 7 15/16	2
		315TBP307	3 7/16	7/8 x 7/16 x 7 15/16	2
		315TBP315	3 15/16	1 x 1/2 x 7 15/16	2
	Metric *	315TBP90MM	90mm	25 x 7 x 190 (mm)	2

1.6 Mounting Of Reducer with Finished Bore Shaft

1.6.1 Check the internal bore of the reducer and make sure the snap ring and washer are in the end of the shaft bore opposite the entry side of the driven shaft.

1.6.2 Check the driven shaft to make sure it is free from burrs and any rust preventative coating. Lubricate the driven shaft to ease mounting with reducer. (Anti-Fretting grease is recommended **only** for finished bore designs). A lifting lug is only for lifting the weight of the reducer/gearmotor.

WARNING! (Do not use the lifting lug on the gear housing to lift additional attached assemblies to avoid overloading the lifting lug). Never lift gear unit by its output shaft.

1.6.3 Check the driven shaft to ensure the end is tapped. Install the shaft key in the keyseat.

1.6.4 Rotate the OtN input until the hollow output shaft is aligned with the key in the driven shaft.

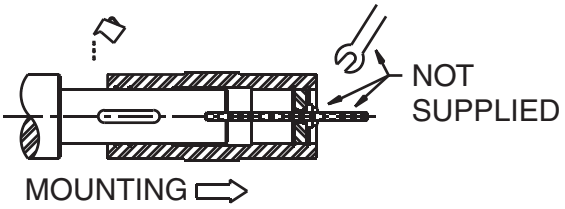
1.6.5 The OtN gear shaft is mounted on the driven shaft using a threaded rod, and screwed into the shaft.

By then threading a nut down onto the washer in the reducer shaft, the shaft is smoothly inserted into the cylindrical bore of the reducer shaft.

1.6.6 Replace the threaded rod with the bolt that is supplied with the OtN unit. Thread it into the driven shaft and tighten to the required torque. See bolt torque as shown in Table 1.2.5.

1.6.7 Install the hollow shaft cover onto the gear housing opposite the driven shaft with the two (2) screws provided with the cover.

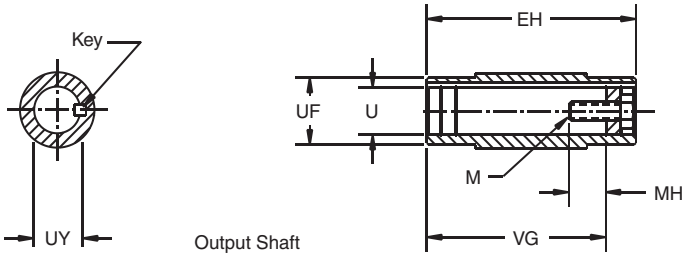
1.6.8 Drive Shaft Recommendations - Its best to use the keeper bolt to pull the driven shaft into the quill up against a shoulder on the driven shaft.

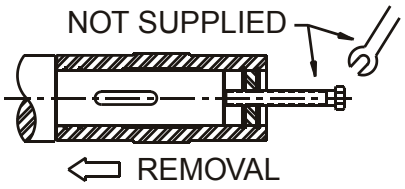


1.7 Dismounting of the Reducer from driven shaft

1.7.1 Secure the reducer weight.

1.7.2 Thread in a long bolt that has the same thread design as the threaded core of the reducer shaft's washer (see Table 7-1 below). By tightening down that bolt, the driven shaft will be separated smoothly from the reducer shaft bore.





Gear Frame	Version	Reducer Shaft						Driven Shaft		Keeper Washer Thread UNC
		EH	U	UF	UY	VG	MH	Key [1]	M (inches)	
31	S2	5.12	1.250	1.77	1.372	4.31	0.37	1/4 x 1/4 x 1-1/2	7/16-14 x 1.00	5/8
32	S2	5.94	1.375	1.96	1.523	5.06	0.37	5/16 x 5/16 x 1-13/16	1/2-13 x 1.00	5/8
	S3	5.94	1.250	1.96	1.372	5.19	0.37	1/4 x 1/4 x 1-13/16	7/16-14 x 1.00	5/8
33	S2	6.94	1.500	2.16	1.674	5.96	0.49	3/8 x 3/8 x 2-1/4	5/8-11 x 1.75	3/4
34	S2	8.97	2.000	2.56	2.210	7.44	0.72	1/2 x 7/16 x 2-5/8	5/8-11 x 1.75	3/4
35	S2	9.66	2.375	3.54	2.638	8.15	0.85	5/8 x 5/8 x 3-3/8	3/4-10 x 2.0	7/8
36	S2	12.44	2.750	3.93	3.037	10.89	1.23	5/8 x 5/8 x 5-1/2	3/4-10 x 2.0	1
37	S2	13.59	3.625	4.72	4.019	11.9	1.23	7/8 x 7/8 x 5-1/2	3/4-10 x 2.0	1
38	S2	13.74	4.00	5.50	4.316	11.69	1.58	1 x 1 x 6	1-8 x 2.5	1.25

[1] the key for the frame 34 is supplied by Browning

Torque Arm Assembly Instructions

Mounting Instructions

1. For Series 3000, mount the torque arm as shown in Figure 5 to side of the reducer where the driven shaft enters. Apply Loctite* 432 or equal to the threads of each bolt before assembly.
2. Connect the reducer to the driven shaft.
3. Attach torque arm to the mounting plate or attachment point.
4. Tighten the cap screws to the recommended torque.

Series 3000 Torque Arm Kits

Table 1

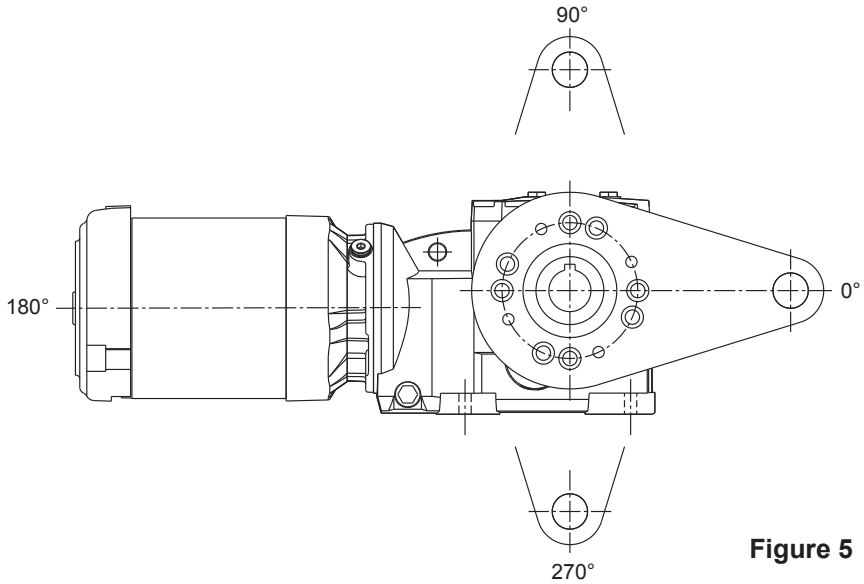
OtN Frame	Kit Part ID#
31	ROC100KT001
32	ROC200KT001
33	ROC300KT001
34	ROC400KT001
35	ROC500KT001
36	ROC600KT001
37	ROC700KT001
38	ROC800KT001

Table 2

Fastener Size	Torque (Ft. Lbs)
M10	49
M12	87
M16	220
M20	430

Table 3

OtN Frame(s)	Kit Hardware
31 and 32	Screws (4)
	Roll Pin (1)
33, 34, 35	Screws (3)
	Roll Pin (1)
36 and 37	Screws (4)
	Roll Pin (1)
38	Screws (8)
	Roll Pin (2)



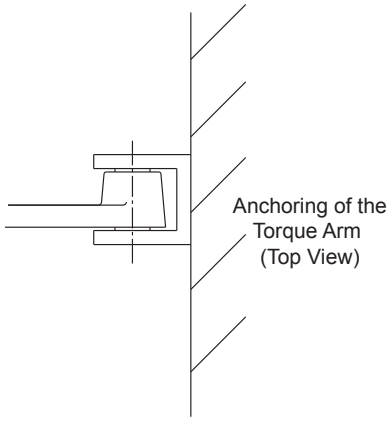


Figure 5

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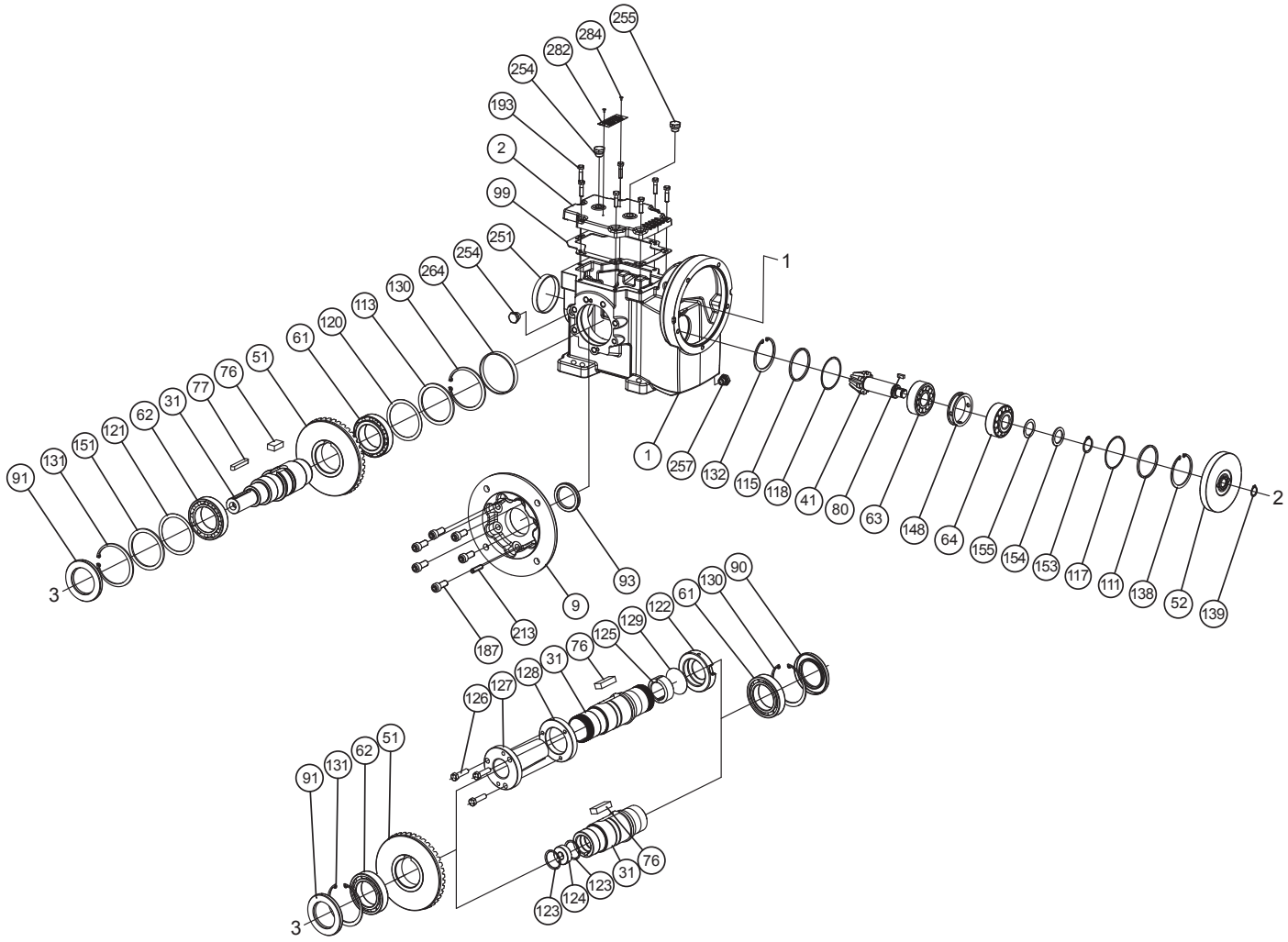
OtN SERIES 3000 GEARMOTORS AND REDUCER



Parts List - Two Stage Frames 31 and 32

Item #	Description	Qty Per Frame	
		31	32
1	Main housing	1	1
2	Top cover	1	1
9	Output flange (primary)	1	1
10	Output flange (secondary)	1	1
15	Output shaft cover (hollow design)	1	1
31	Output shaft	1	1
41	Bevel pinion	1	1
51	Bevel Gear	1	1
52	Primary gear axis 2	1	1
61	Bearing axis 4	1	1
62	Bearing axis 4	1	1
63	Bearing axis 2 front	1	1
64	Bearing axis 2 rear	1	1
76	Key for gear	1	1
77	Output shaft key D or G	1	1
80	Key primary gear	1	1
90	Output oil seal left	1	1
91	Output oil seal right	1	1
93	Output seal - flange option	1	1
99	Top cover gasket	1	1
111	Shim	1	1
113	Spacer	1	1
115	Shim	1	1
117	Shim axis 2 rear	1	1
118	Shim axis 2 front	1	1
120	Bearing shim	1	1
121	Bearing shim	1	1
122	End cap for B design	1	1

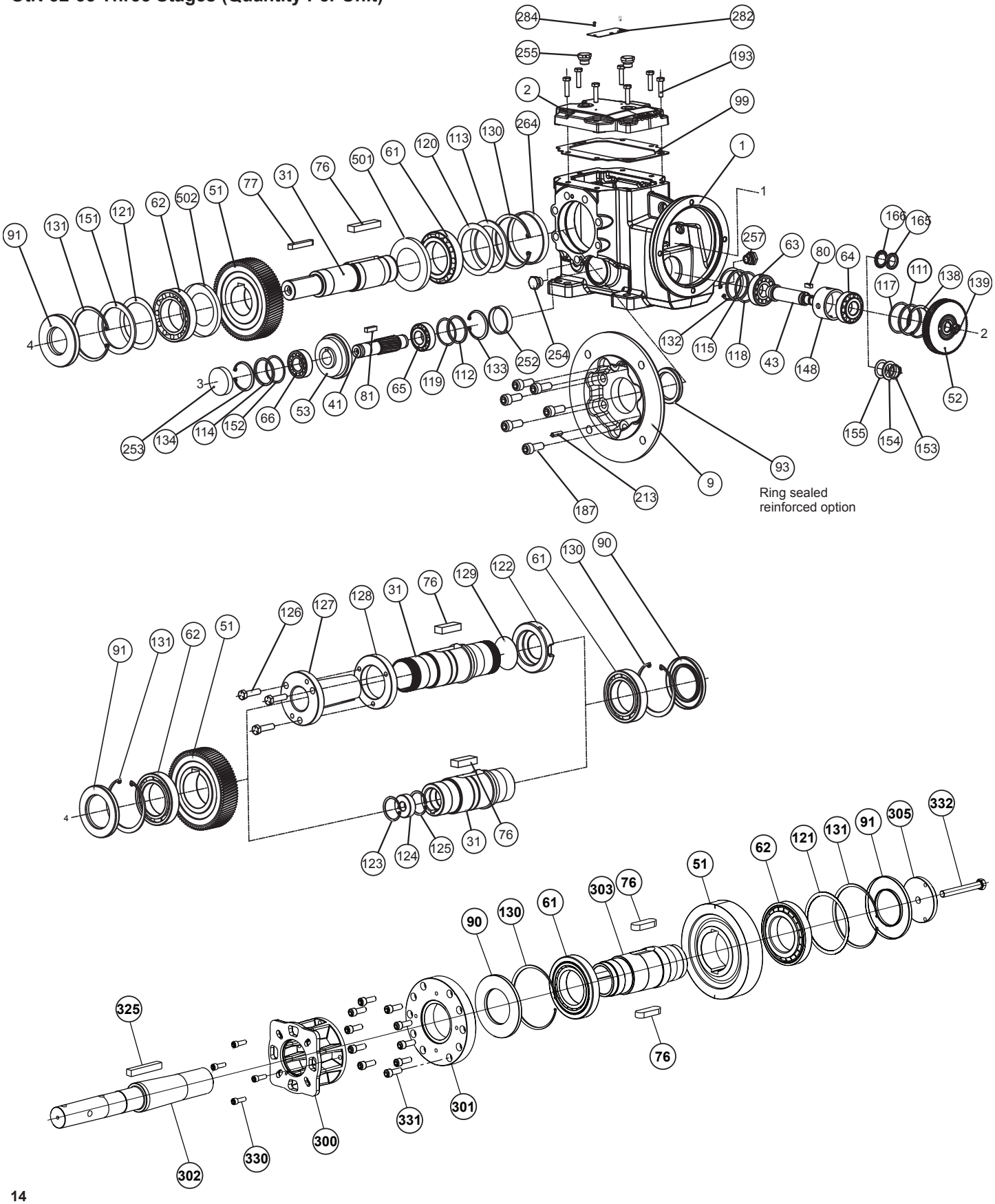
Item #	Description	Qty Per Frame	
		31	32
123	Internal snap ring	2	2
124	Extraction washer	1	1
125	Stabilizer collar for B design	1	1
126	Bushing cap screws	3	3
127	Bushing for B design	1	1
129	Dust cover	1	1
130	Bearing snap ring axis #4	1	1
131	Bearing snap ring axis #4	1	1
132	Bearing snap ring axis 2	1	1
136	Snap ring MD axis 4	1	2
138	Bearing snap ring axis 2	1	1
139	Snap ring for primary gear	1	1
148	Spacer axis 2	1	1
151	Spacer	1	1
153	Snap ring axis 2	1	1
154	Washer axis 2	1	1
155	Shim axis 2	1	1
187	Flange bolts	4	6
193	Top cover screws	6	7
203	Cover screws for Rep #15	2	2
213	Flange roll pin	1	1
251	Bore Plug	0	1
254	Plain plugs	4	4
255	Breather	1	1
257	Magnetic drain plug	1	1
264	Bore plug axis 4 for D and G	1	1
282	Nameplate	1	1
284	Nameplate rivets	2	2

Common Replacement Parts

Frame Size	Shaft	Bearings		Oil Seals		Top Cover Gasket
		61	62	90	91	
31	G-D	32009	32009	45 x 75 x 8	*	JOI156JN001
	X	32009	32009	45 x 75 x 8	45 x 75 x 8	
	C-B	6009 2RS	6009 2RS	45 x 75 x 8	45 x 75 x 8	
32	G-D	32010	32010	50 x 80 x 10	*	JOI185JN003
	X	32010	32010	50 x 80 x 10	50 x 80 x 10	
	C-B	6010 2RS	6010 2RS	50 x 80 x 10	50 x 80 x 10	

* Bore plug utilized

OtN 32-35 Three Stages (Quantity Per Unit)



Parts List - Three Stage Frame 32 through 35

Item #	Description	Qty Per Frame			
		32	33	34	35
1	Main housing	1	1	1	1
2	Top cover	1	1	1	1
9	Output flange (primary)	1*	1*	1*	1*
10	Output flange (secondary) +	1*	1*	1*	1*
15	Output shaft cover (hollow design)	1	1	1	1
31	Output shaft	1	1	1	1
41	Pinion axis 3	1	1	1	1
43	Bevel pinion axis 2	1	1	1	1
51	Gear axis 4	1	1	1	1
52	Gear axis 2	1	1	1	1
53	Bevel gear axis 3	1	1	1	1
61	Bearing axis 4 left	1	1	1	1
62	Bearing axis 4 right	1	1	1	1
63	Bearing axis 2 front	1	1	1	1
64	Bearing axis 2 rear	1	1	1	1
65	Bearing axis 3 right	1	1	1	1
66	Bearing axis 3 left	1	1	1	1
76	Key for axis 4 gear (rep 51)	1	1	1	1
77	Output shaft key D or G	1	1	1	1
80	Key (prim. gear)	1	1	1	1
81	Key (rep. 53)	1	1	1	1
90	Oil seal axis 4 right	1	1	1	1
91	Oil seal axis 4 left	1	1	1	1
93	Ring seal axis 4 (option)	1	1	1	1
99	Top cover gasket	1	1	1	1
103	Oil deflector	1	1	1	1
111	Bearing spacer axis 2	1	1	1	1
112	Bearing spacer axis 3 right	1	1	1	1
114	Bearing spacer axis 3 left	1	1	1	1
115	Bearing spacer axis 2 front	1	1	1	1
117	Shim axis 2 rear	1 to 3	3	3	3
118	Shim axis 2 front	1 to 3	3	3	3
119	Shims axis 3	1 to 4	4	2 or 3	3
120	Bearing shim (SCD)	1	1	1	1
121	Bearing shim (SCD)	1	1	1	1
122	End cap	1	1	1	1
123	Snap ring	1	1	1	1
124	Extraction washer	1	1	1	1
125	Snap ring	1	1	1	1
126	Bushing capscrews	3	3	3	3
127	tapered bushing	1	1	1	1
128	Bushing collar	1	1	1	1

Item #	Description	Qty Per Frame			
		32	33	34	35
129	Dust cover	1	1	1	1
130	Bearing snap ring axis #4	1	1	1	1
131	Bearing snap ring axis #4	1	1	1	1
132	Bearing snap ring axis 2	1	1	1	1
133	Bearing snap ring axis 3	1	1	1	1
134	Snap ring axis #4	1	1	1	1
136	Snap ring MD axis 4	2	2	2	2
138	Bearing snap ring axis 2	1	1	1	1
139	Primary gear fixing snap ring	1	1	1	1
142	Primary Gear fixing screw	0	0	0	0
148	Spacer axis 2	1	1	1	1
152	Shims axis 3	1 or 2	4	2 or 3	3
153	Snap ring axis 2	1	1	1	1
154	Washer axis 2	1	1	1	1
155	Shim axis 2	2	2	2	2
165	Nut (rep 64)	0	0	0	0
166	Lock washer (rep 165)	0	0	0	0
187	Flange screws	4	6	6	6
193	Top cover screws	7	7	7	7
213	Roll pin (flange)	1	1	1	1
251	Bore Plug	0	1	0	0
252	Bore plug axis 3 left	1	1	1	1
253	Bore plug axis 3 right	1	1	1	1
254	Plain plugs	2	3	3	2
255	Breather plug	1	1	1	1
257	Magnetic Pipe Plug	1	1	1	1
261	Breather plug with dipstick	0	0	0	0
264	Bore plug axis 4	1	1	1	1
282	nameplate	1	1	1	1
284	nameplate rivets	2	2	2	2
501	Nilos deflector axis 4 (left)	0	0	0	0
502	Nilos deflector axis 4 (right)	0	0	0	0

+ not illustrated in exploded view drawing

** there are (2) used on C, B shafts

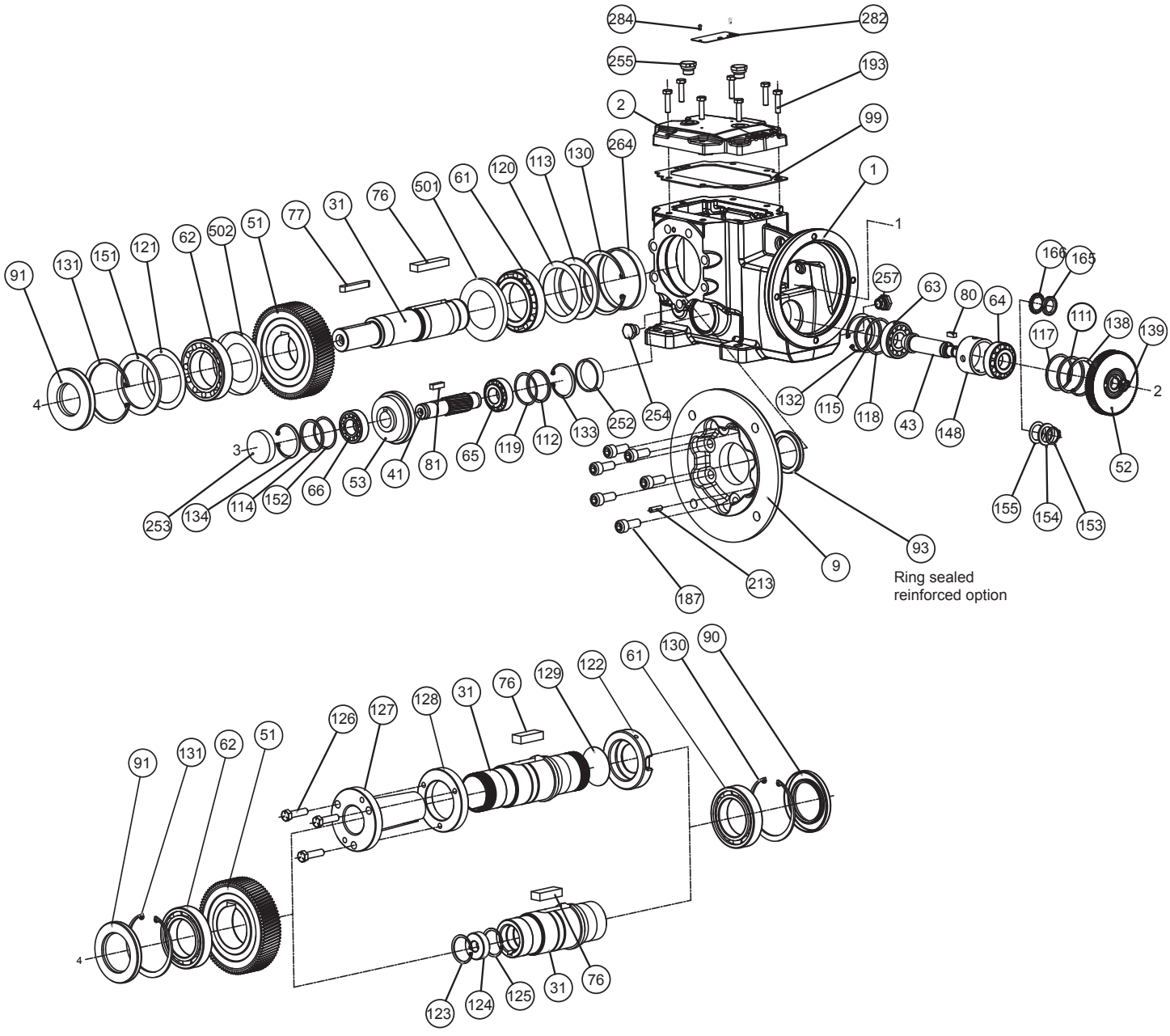
*** not used on C, B shafts

Common Replacement Parts

Frame Size	Shaft	Bearings		Oil Seals		Top Cover Gasket
		61	62	90 (mm)	91 (mm)	
32	G-D	6208 ZZ C3	6208 ZZ C3	40 x 80 x 10	*	JOI161JN002
	X	6208 ZZ C3	6208 ZZ C3	40 x 80 x 10	40 x 80 x 10	
	C-B	6010 ZZ C3	6010 ZZ C3	50 x 80 x 8	50 x 80 x 8	
33	G-D	6309 ZZ C3	6309 ZZ C3	45 x 100 x 8	*	JOI208JN002
	X	6309 ZZ C3	6309 ZZ C3	45 x 100 x 8	45 x 100 x 8	
	C-B	6211 ZZ C3	6211 ZZ C3	55 x 100 x 10	55 x 100 x 10	
33A	C-B	6013 ZZ C3	6013 ZZ C3	65 X 100 X 10	65 x 100 x 10	JOI208JN002
34	G-D	6213 ZZ C3	6213 ZZ C3	65 x 120 x 10	*	JOI247JN001
	X	6213 ZZ C3	6213 ZZ C3	65 x 120 x 10	65 x 120 x 10	
	C-B	6213 ZZ C3	6213 ZZ C3	65 x 120 x 10	65 x 120 x 10	
35	G-D	6313 ZZ C3	6313 ZZ C3	65 x 140 x 12	*	JOI295JN002
	X	6313 ZZ C3	6313 ZZ C3	65 x 140 x 12	65 x 140 x 12	
	C-B	6018 ZZ C3	6018 ZZ C3	90 x 140 x 11	90 x 140 x 11	

*** Bore plug utilized**

OtN 36-38 Three Stages (Quantity Per Unit)



Parts List - Three Stage Frame 36 through 38

Item #	Description	Qty Per Frame		
		36	37	38
1	Main housing	1	1	1
2	Top cover	1	1	1
9	Output flange (primary)	1	1	0
10	Output flange (secondary) +	1	1	n/a
15	Output shaft cover (hollow design)	1	1	1
31	Output shaft	1	1	1
41	Pinion axis 3	1	1	1
43	Bevel pinion axis 2	1	1	1
51	Gear axis 4	1	1	1
52	Gear axis 2	1	1	1
53	Bevel gear axis 3	1	1	1
61	Bearing axis 4 left	1	1	1
62	Bearing axis 4 right	1	1	1
63	Bearing axis 2 front	1	1	1
64	Bearing axis 2 rear	1	1	1
65	Bearing axis 3 right	1	1	1
66	Bearing axis 3 left	1	1	1
76	Key for axis 4 gear (rep 51)	1	1	1 **
77	Output shaft key D or G	1	1	1
80	Key (prim. gear)	1	1	1
81	Key (rep. 53)	1	1	1
90	Oil seal axis 4 right	1	1	1
91	Oil seal axis 4 left	1	1	1
93	Ring seal axis 4 (option)	1	1	0
94	O-ring seal axis 4 +	0	0	2***
95	Bearing carrier axis 4 +	0	0	2***
99	Top cover gasket	1	1	1
103	Oil deflector	1	1	1
111	Bearing spacer axis 2	1	1	1
112	Bearing spacer axis 3 right	1	1	1
114	Bearing spacer axis 3 left	1	1	1
115	Bearing spacer axis 2 front	1	1	1
117	Shim axis 2 rear	1 to 3	1 to 3	1 to 3
118	Shim axis 2 front	1 to 3	1 to 3	1 to 3
119	Shims axis 3	1 to 3	1 to 3	1 to 3
120	Bearing shim (SCD)	1	1	0
121	Bearing shim (SCD)	1	1	0
122	End cap	1	1	1
123	Snap ring	1	1	1
124	Extraction washer	1	1	1
125	Snap ring	1	1	1
126	Bushing capscrews	3	3	1
127	Tapered bushing	1	1	1

Item #	Description	Qty Per Frame		
		36	37	38
128	Bushing collar	1	1	1
129	Dust cover	1	1	1
130	Bearing snap ring axis #4	1	1	1
131	Bearing snap ring axis #4	1	1	1
132	Bearing snap ring axis 2	1	1	1
133	Bearing snap ring axis 3	1	1	1
134	Snap ring axis #4	1	1	1
136	Snap ring MD axis 4	2	2	0
138	Bearing snap ring axis 2	1	1	1
139	Primary gear fixing snap ring	1	0	1
142	Primary Gear fixing screw	0	1	0
148	Spacer axis 2	1	1	1
152	Shims axis 3	1 to 3	1 to 3	1 to 3
153	Snap ring axis 2	0	0	0
154	Washer axis 2	0	0	0
155	Shim axis 2	0	0	0
165	Nut (rep 64)	1	1	1
166	Lock washer (rep 165)	1	1	1
187	Flange screws	7	9	11
193	Top cover screws	10	11	11
213	Roll pin (flange)	1	1	1
251	Bore Plug	0	0	0
252	Bore plug axis 3 left	1	1	1
253	Bore plug axis 3 right	1	1	1
254	Plain plugs	5	5	4
255	Breather plug	0	0	0
257	Magnetic Pipe Plug	1	1	1
261	Breather plug with dipstick	1	1	1
264	Bore plug axis 4	1	1	1
282	nameplate	1	1	1
284	nameplate rivets	2	2	2
501	Nilos deflector axis 4 (left)	1	1	1
502	Nilos deflector axis 4 (right)	1	1	1

+ not illustrated in exploded view drawing
** there are (2) used on C,B shafts
*** not used on C,B shafts

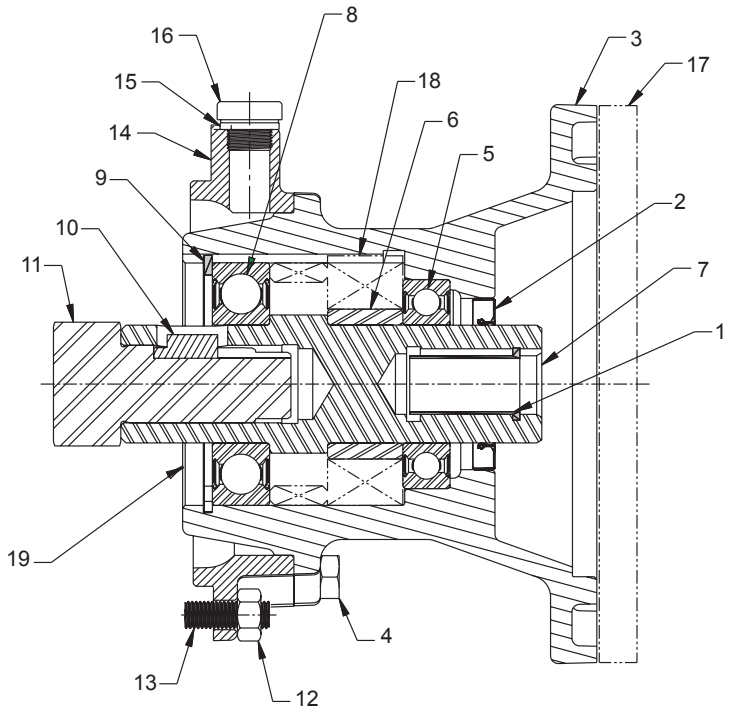
Common Replacement Parts

Frame Size	Shaft	Bearings		Oil Seals		Top Cover gasket
		61	62	90	91	
36	G-D	32020	32020	85 x 150 x 12	*	JOI414JN001
	X	32020	32020	85 x 150 x 12	85 x 150 x 12	
	C-B	6020 ZZ	6020 ZZ	100 X 150 X 13	100 X 150 X 13	
37	G-D	32024	32024	120 X 180 X 15	*	JOI475JN001
	X	32024	32024	120 X 180 X 15	120 X 180 X 15	
	C-B	6024 ZZ	6024 ZZ	120 X 180 X 15	120 X 180 X 15	
38	G-D	30220	30220	120 X 180 X 15	*	JOI475J N001
	X	30224	30224	120 X 180 X 15	120 X 180 X 15	
	C-B	30228	30228	140 x 250 x 15	140 x 250 x 15	

* Bore plug utilized

C - Face Input Parts List

OtN 31 - 38 Two and Three Stage (Quantity Per Unit)



No.	Description	56C	140TC	180TC	210TC	250TC	280TC
1	Non-metallic Liner	1	1	1	1	1	1
2	Seal	1	1	1	1	1	1
3	Motor Adapter	1	1	1	1	1	1
4	Cap screw	6	6	6	6	6	6
5	Bearing	1	1	1	1	1	1
6	Spacer	1	1	1	1	1	1
7	Input Shaft	1	1	1	1	1	1
8	Bearing	1	1	1	1	1	1
9	Internal Snap Ring	1	1	1	1	1	1
10	Key*	1	1	1	1	1	1
11	Pinion	1	1	1	1	1	1
12	Nuts Q	**	**	**	**	**	**
13	Studs Q	**	**	**	**	**	**
14	Adapter Flange	1	1	1	1	1	1
15	Gasket	1	1	1	1	1	1
16	Plug ***	1	1	1	1	1	1
17	Motor Adapter Flange	N/A	N/A	N/A	N/A	N/A	1
18	Backstop Kit (optional)	1	1	1	1	1	1
19	Nilos Seal	0	0	0	0	1	1

* Pin used with 9mm, 12mm, 15mm, and 18mm pinions

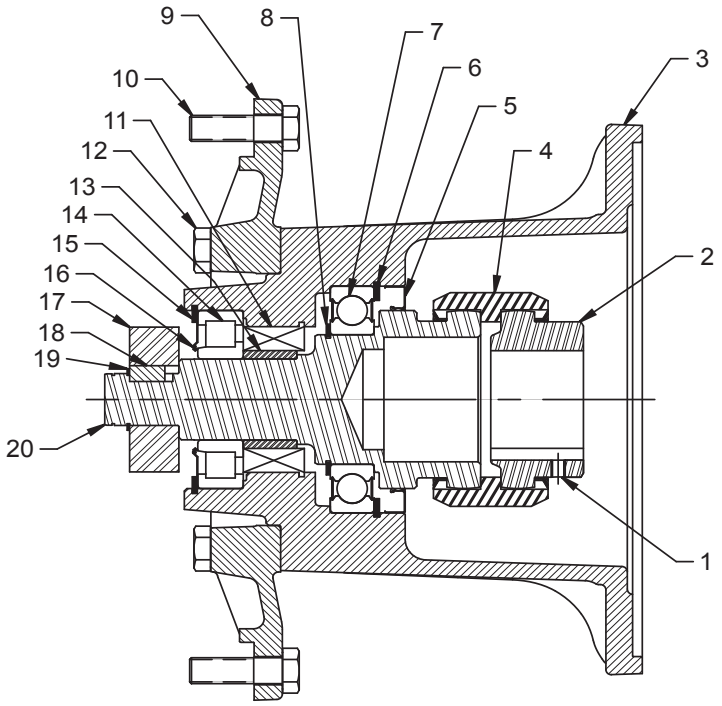
** Depending on gear frame and red.stages:Two stages 31=4, 32=5; Three stages 32,35=4 ,33=5,34=6, 36,37=8

*** For frames 31 through 35 these are 1/4” BSP, and 3/4” BSP on frames 36 and larger

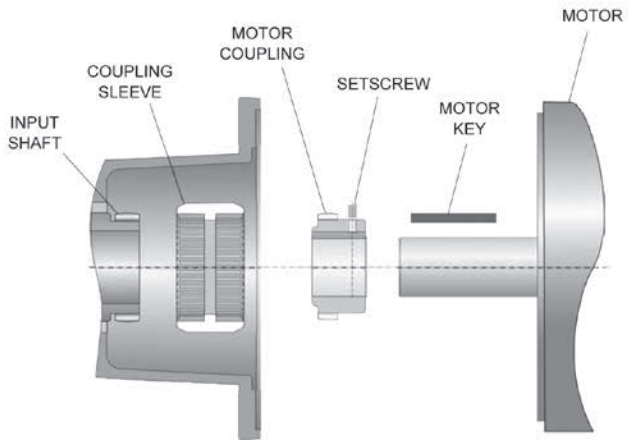
Gear Frame	Motor Frame	Bearings		Seal (inches)
		5	8	2
31 to 35	56C , 140TC	6007 ZZ C3	6207 ZZ C3	2 x 1.375 x .312
32 to 37	180TC	6012 ZZ C3	6210 ZZ C3	4 x 2.250 x .468
33 to 38	210TC	6012 ZZ C3	6210 ZZ C3	4 x 2.250 x .468
35 to 38	250TC, 280TC	6014 ZZ C3	NJ210	4.438 x 2.625 x .437

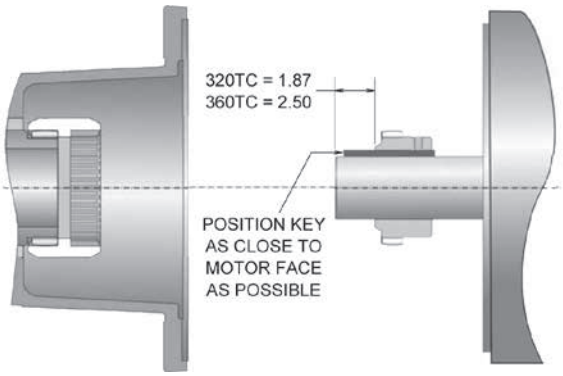
C-Face Coupling Input Parts List

OtN 36 - 38 Three Stage (Quantity Per Unit)



No.	Description Of Part	320TC/360TC
1	Setscrew	1
2	Motor Coupling	1
3	Motor Adapter	1
4	Coupling Sleeve	1
5	Seal	1
6	Internal Snap Ring	1
7	Bearing	1
8	External Snap Ring	1
9	Adapter Flange	1
10	Capscrew	8
11	Backstop	1
12	Capscrew	12
13	Spacer	1
14	Bearing	1
15	Internal Snap Ring	1
16	Bearing Seal	1
17	Pinion	1
18	Key	1
19	External Snap Ring	1
20	Input Shaft	1

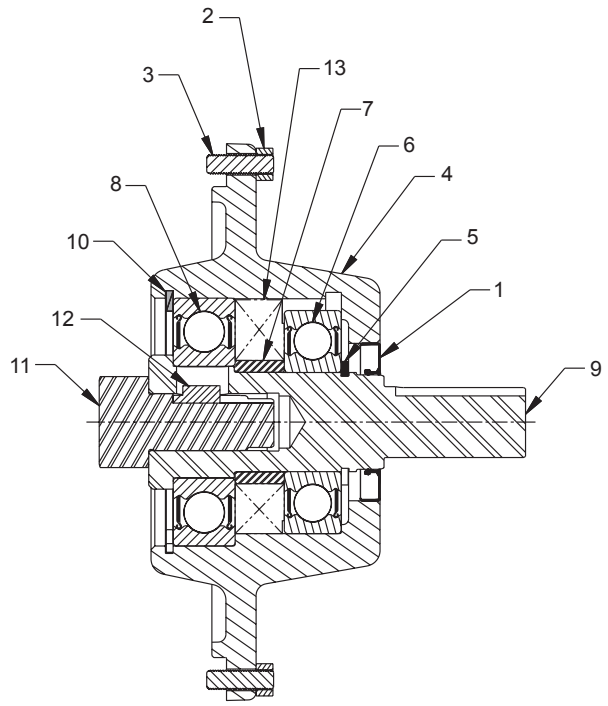




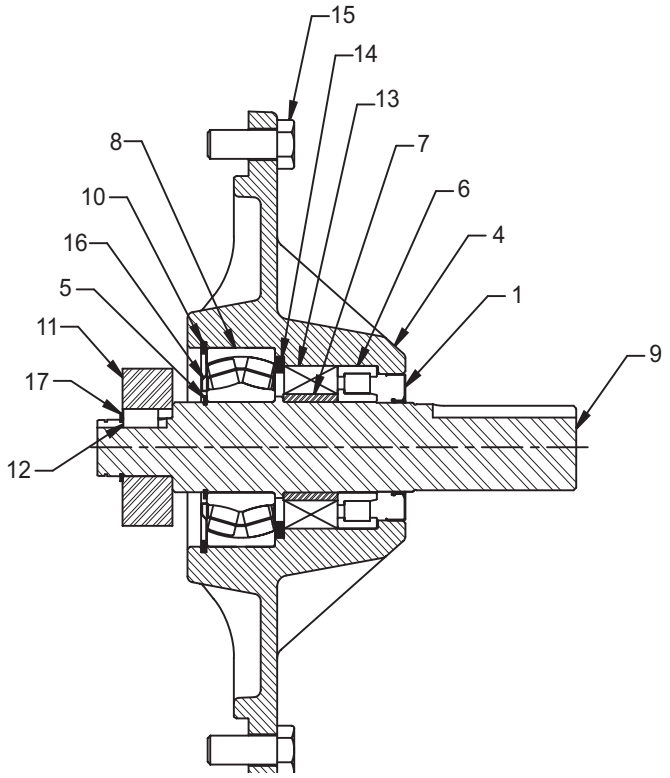
Gear Frame	Bearings		Seal
	7	14	1
36 to 38	6216 ZZ C3	NJ310	140x110x12 (mm) nitrile

AP Input Shaft Parts List

OtN 31 - 35 Two and Three Stage (Quantity Per Unit)



OtN 36 - 38 Three Stage



No.	Description of Part	Double Reduction		Triple Reduction				
		31	32	32	33	34	35	36, 37, 38
1	Seal	1	1	1	1	1	1	1
2	Nuts	4	5	4	5	6	4	0
3	Studs	4	5	4	5	6	4	0
4	Housing	1	1	1	1	1	1	1
5	External Snap Ring	1	1	1	1	1	1	1
6	Bearing	1	1	1	1	1	1	1
7	Spacer	1	1	1	1	1	1	1
8	Bearing	1	1	1	1	1	1	1
9	Input Shaft	1	1	1	1	1	1	1
10	Internal Snap Ring	1	1	1	1	1	1	1
11	Pinion	1	1	1	1	1	1	1
12	Key*	1	1	1	1	1	1	
13	Backstop Kit (optional)	1	1	1	1	1	1	1
14	Spacer	-	-	-	-	-	-	1
15	Bolt	-	-	-	-	-	-	8
16	Bearing Seal	-	-	-	-	-	-	1
17	External Snap Ring	-	-	-	-	-	-	1

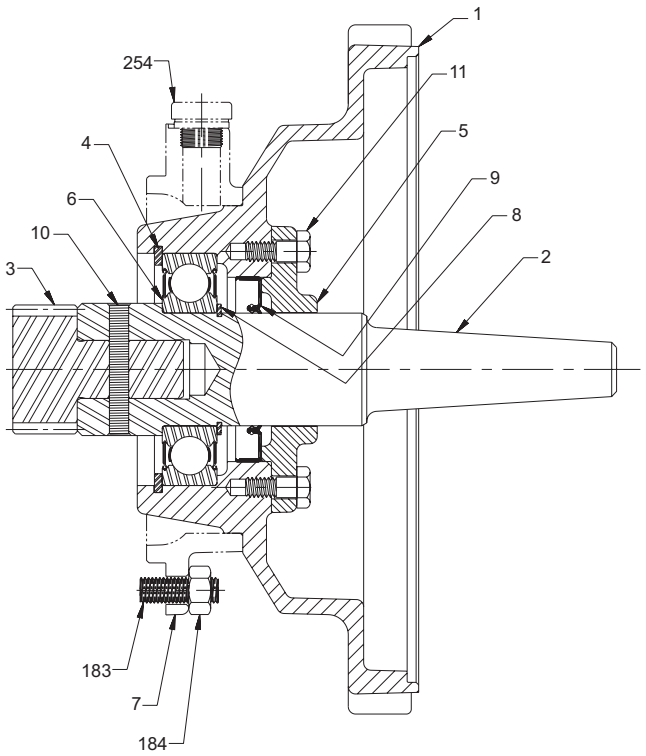
* Pin used with 9mm, 12mm, 15mm, and 18mm pinion

Gear Frame	Bearings		Seal (inches)
	6	8	1
31, 32, 33	6206 ZZ C3	6207 ZZ C3	1.875 x 1.125 x 0.25 DL, nitrile
34	6308 ZZ C3	6309 ZZ C3	2.5 x 1.50 x 0.312 DL, nitrile
35	NJ209	6311 ZZ C3	2.5 x 1.50 x 0.312 DL, nitrile
36, 37, 38	22310	NJ2210	3.1878 x 1.938 x 0.438 DL, nitrile

DL - double lipped seal designs

Gear Motor Input Parts List

OtN 31 - 38 Two and Three Stage (Quantity Per Unit)



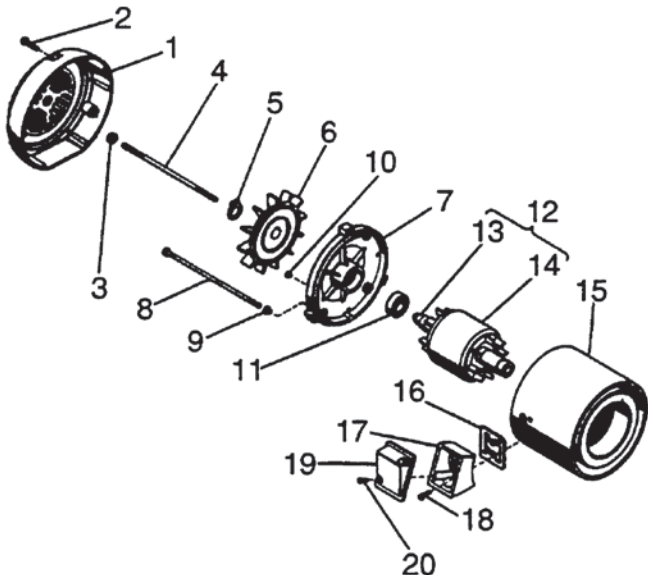
No.	Description Of Part	Double Reduction		Triple Reduction				
		31	32	32	33	34	35	36, 37, 38
1	Motor Adapter	1	1	1	1	1	1	1
2	Input Shaft	1	1	1	1	1	1	1
3	Pinion	1	1	1	1	1	1	1
4	Internal Snap Ring	1	1	1	1	1	1	1
5	Bearing Cap**	1	1	1	1	1	1	1
6	Bearing Cap**	1	1	1	1	1	1	1
7	Adapter Flange	1	1	1	1	1	1	1
8	External Snap Ring	1	1	1	1	1	1	1
9	Seal	1	1	1	1	1	1	1
10	Pinion Pin	1	1*	1	1*	1*	1*	N/A
11	Cap screw**	2	2	2	2	2	2	2
183	Stud	4	5	4	5	6	4	8
184	Nut	4	5	4	5	6	4	8
254	Plug (or Breather)	1	1	1	1	1	1	1

* key used with 23mm and 32mm pinions.
** Explosion proof motor only

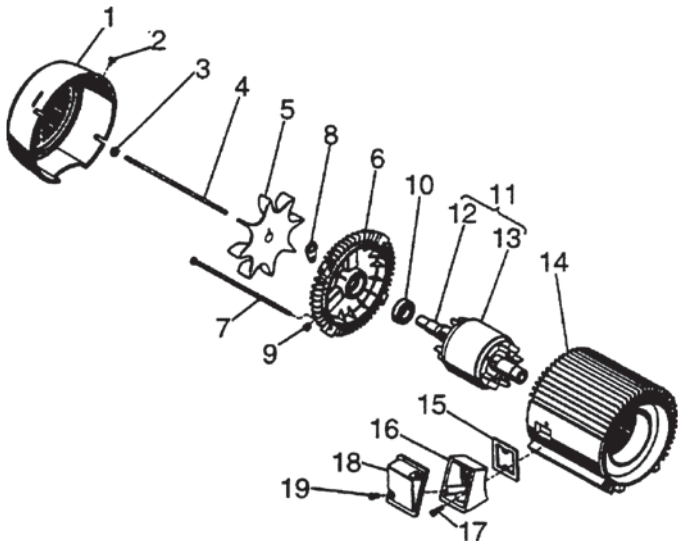
Bearings and Seals

Reduction Stages	Gear Frame	Motor Frame	Bearing	Seal (inches)
			6	9
2	31	48	6005 ZZ C3	1.50 x .937 x .250
	31,32	56, 140T	6007 ZZ C3	2.25 x 1.375 x .312
	32	180T	6207 ZZ C3	2.25 x 1.375 x .312
3 or more	32	48	6005 ZZ C3	1.50 x .937 x .250
	32,33,34,35	56, 140T	6007 ZZ C3	2.25 x 1.375 x .312
	32,33,34,35, 36, 37, 38	180T, 210T	6207 ZZ C3	2.25 x 1.375 x .312
	34	250T	6209 ZZ C3	2.875 x 1.750 x .375
	35, 36, 37, 38	250T, 280T	6310 ZZ C3	3.500 x 2.250 x .375
	36, 37, 38	320T	6311 ZZ C3	3.875 x 2.5 x .470

Integral Motor Parts List



Frames 56, 140T



Frames 180T, 210T, 250T, A280T

Part #	Description	Qty.
1	Fan Cover	1
2	Self Tapping Screw	3
3	Hex Nut	1
4	Stud	1
5	Retaining Snap Ring	1
6	Fan	1
7	Bracket	1
8	Screw	4
9	Bushing	4
10	Plastic Plug	4
11	Ball Bearing	1
12	Rotor Assembly (includes items 13 & 14)	1
13	Shaft	1
14	Rotor Core	1
15	Wound Stator Assembly	1
16	Gasket	1
17	Outlet Box Base	1
18	Self Tapping Screw	2
19	Outlet Box Cover	1
20	Self Tapping Screw	2

Part #	Description	Qty.
1	Fan Cover	1
2	Self Tapping Screw	4
3	Hex Nut	1
4	Stud	1
5	Fan	1
6	Bracket	1
7	Hex Head Bolt	4
8	Lifting Lug	1
9	Hex Countersunk Pipe Plug	2
10	Ball Bearing	1
11	Rotor Assembly (includes items 12 & 13)	1
12	Shaft	1
13	Rotor Core	1
14	Wound Stator Assembly	1
15	Gasket	1
16	Outlet Box Base	1
17	Self Tapping Screw	2
18	Outlet Box Cover	1
19	Self Tapping Screw	2

When ordering replacement motor parts, the following motor nameplate information is required:

- Model #
- Frame Size
- Type
- Horsepower

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